FUNCTIONS

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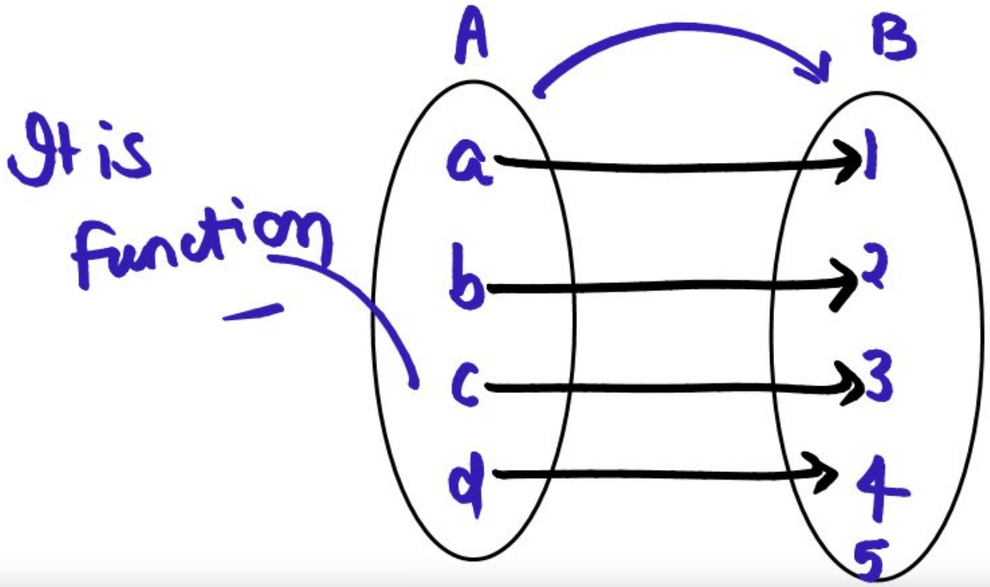
Functions

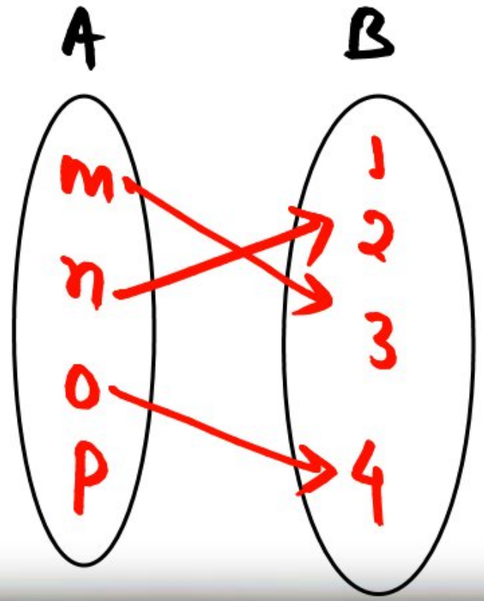
Definition :- If A & B are two empty sets then a subset of $A \times B$ is called a function (or mapping or map) from A to B iff for each $a \in A$, there exists a unique b$\in B$ such that (a,b)$\in f$. It is written as $f: A \to B$.

If f associates $a \in A$ *to* $b \in B$ then
b is the image of a under f
a is the pre-image of under f .

$F: A \to B$



It is function



It is not a function.

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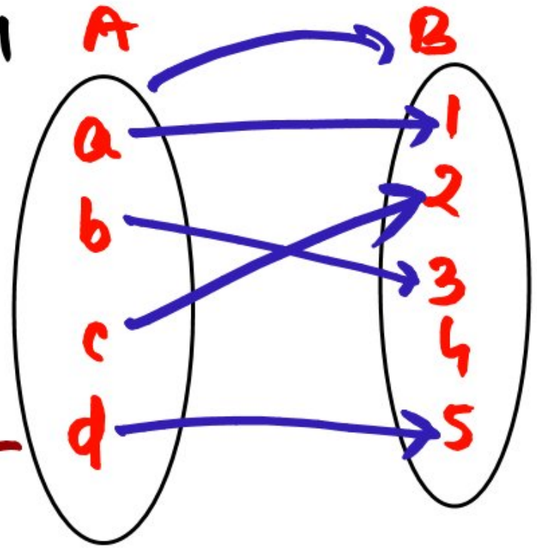
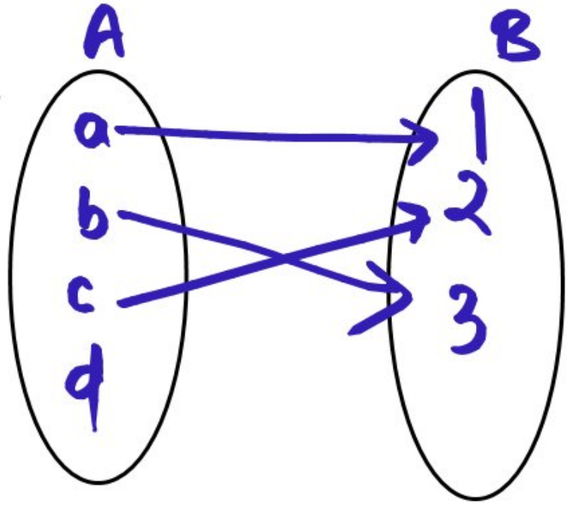
Ex-1



Function

Ex-2

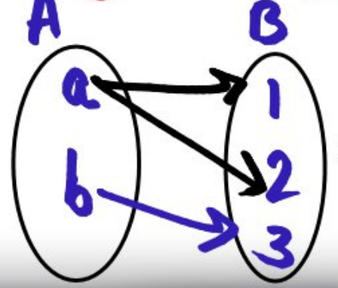


Function (x)

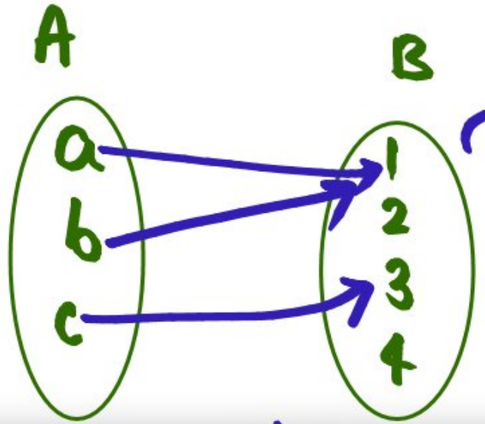
(i) Every Element of A Should be Connected

(ii) Every Element Should be Connected with Unique Element.

$F = \{(a,1),(b,3),(c,2),(d,5)\}$



→ It is not a function



→ It is Function

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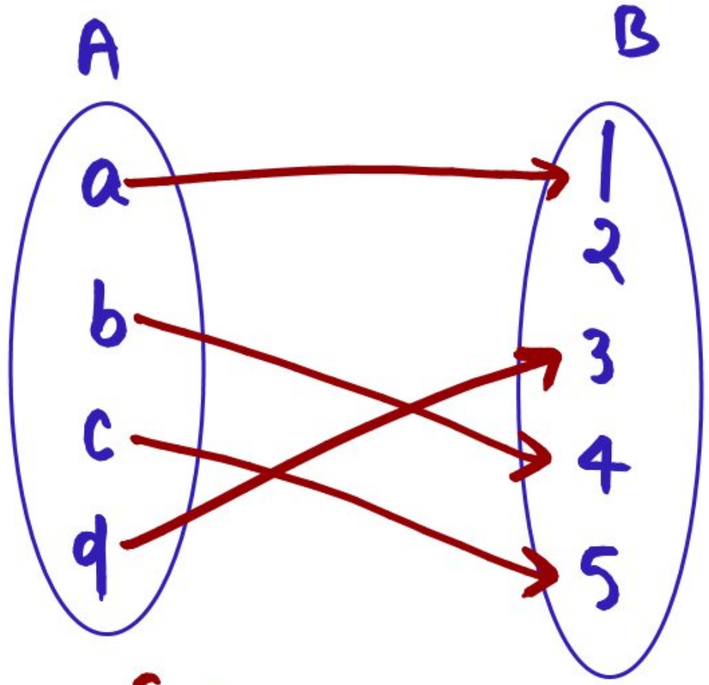
Image & Pri-Image



$F = \{(a,1), (b,4), (c,5), (d,3)\}$

Pri-Image

Image.

$(a,1)$

Image of $a = 1$

Pri-Image of $1 = a$

$(b,4)$

Image of $b = 4$

Pri-Image of $4 = b$

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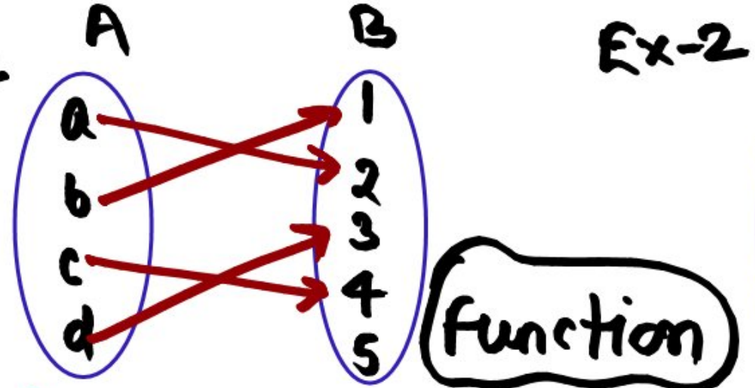
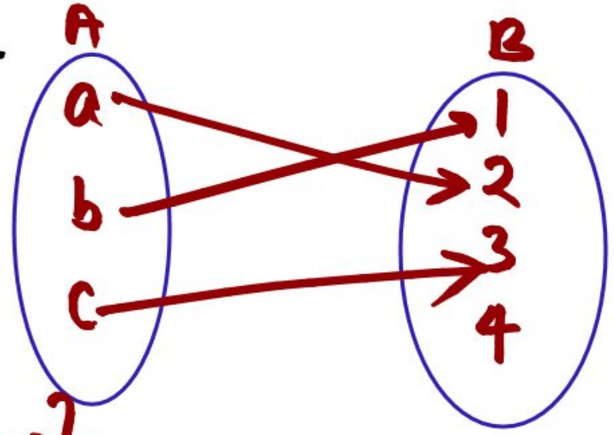
Ex-1



Function

$f = \{(a,2), (a,1), (c,5), (d,3)\}$

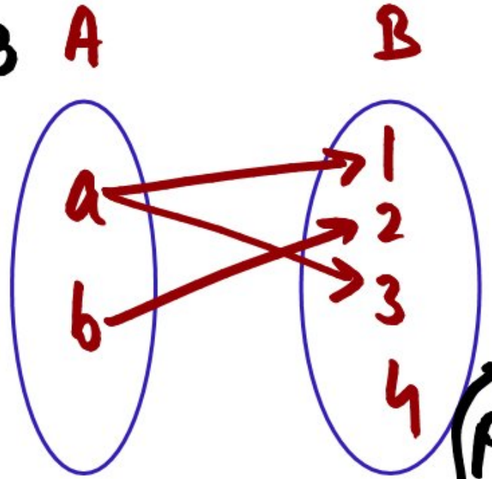
Ex-2



Function.

$F = \{(a,2)\ (b,1)\ (c,3)\}$

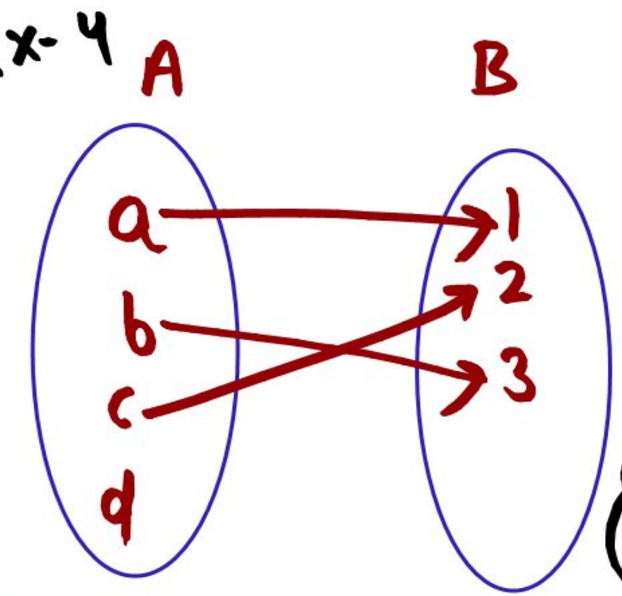
Ex-3



Function Nahi

$F = \{(a,1), (a,3), (b,2)\}$

Ex-4



$F = \{(a,1), (b,3), (c,2)\}$

Function Nahi

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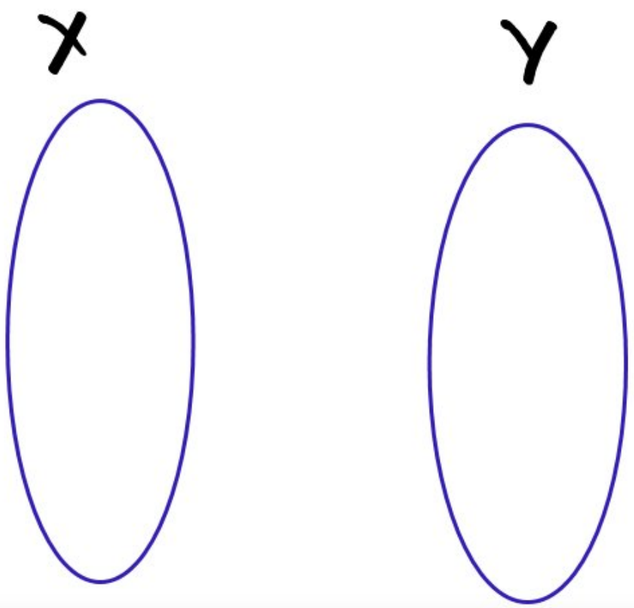
Main Feature of a function

Let f be a function from X to Y then

i) to every $x \in X$, there exists a unique element y$\in Y$ such that $y = f(x)$.
ii) no element of X can have more than one images in Y.
iii) there may be elements of Y which are not associated with any element of X.
iv) distinct elements of X may have same image in Y.
v) function f is determined when f(x) is known for all $x \in X$



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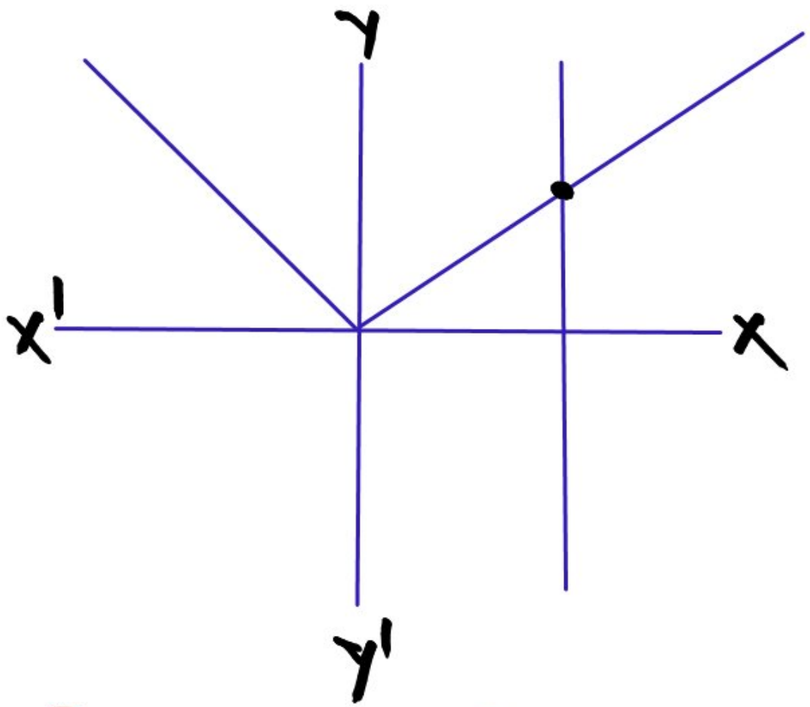
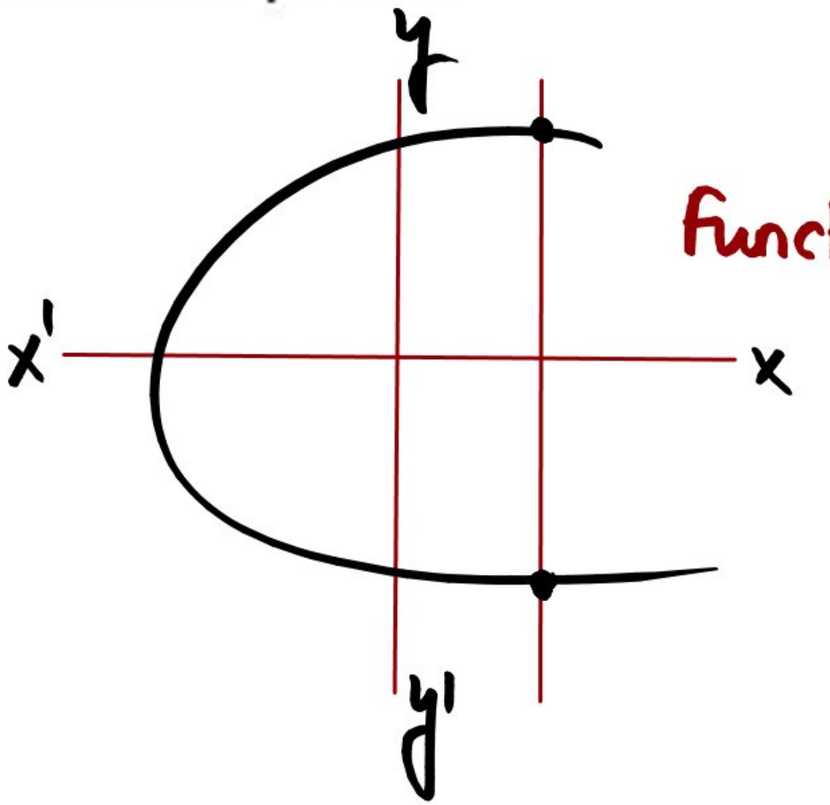
Graph of a Function

A curve will represent graph of a function if any line parallel to y-axis does not intersect the curve at more than one point.



function graph hoga.



Function graph Nahi hoga

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Real Valued of functions

The value of a function y=f(x) at x=a is denoted by f(a).
It is obtained by putting x=a in f(x)

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Domain , Codomain & Range of function

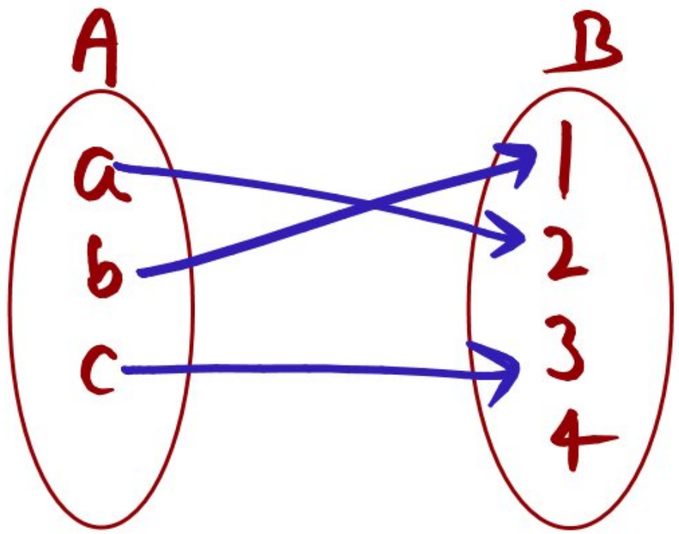
Let a function is defined from non-empty set A to non-empty set B.

f:A→ $B, Then$

A) Set A is called domain of function

B) Set B is called codomain of Function

C) Set of images of different elements of Set A is called range of function.



$F = \{(a,2)(b,1)(c,3)\}$

Domain = $\{a,b,c\}$

Co-domain = $\{1,2,3,4\}$

Range = $\{2,1,3\}$

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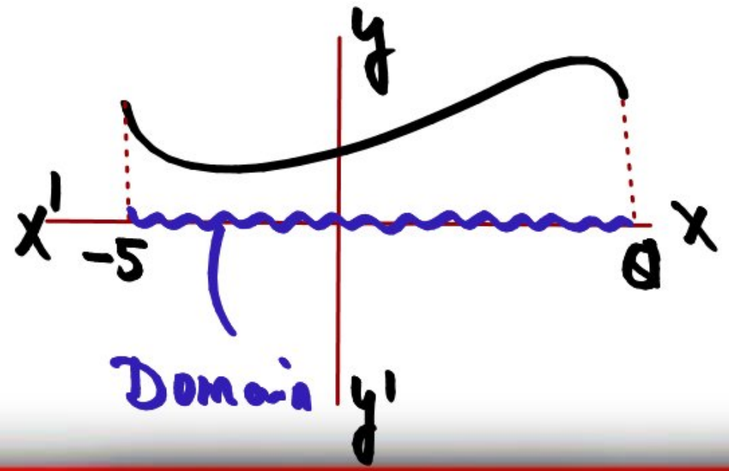
Domain of function

$y = f(x)$

the Set of all the possible Value of Variable x for which Function f(x) is defined.

$F(x) = \frac{1}{x}$ $\quad x \neq 0 \quad x \in R - 0$



The Value on the x-axis Covered by the graph of Function f(x)

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Range of Function

$y = F(x)$

All possible Value of the $F(x)$ is Called Range.

$F(x) = x^2$

$x^2 \geq 0$

$F(x) \geq 0$

Range ≥ 0

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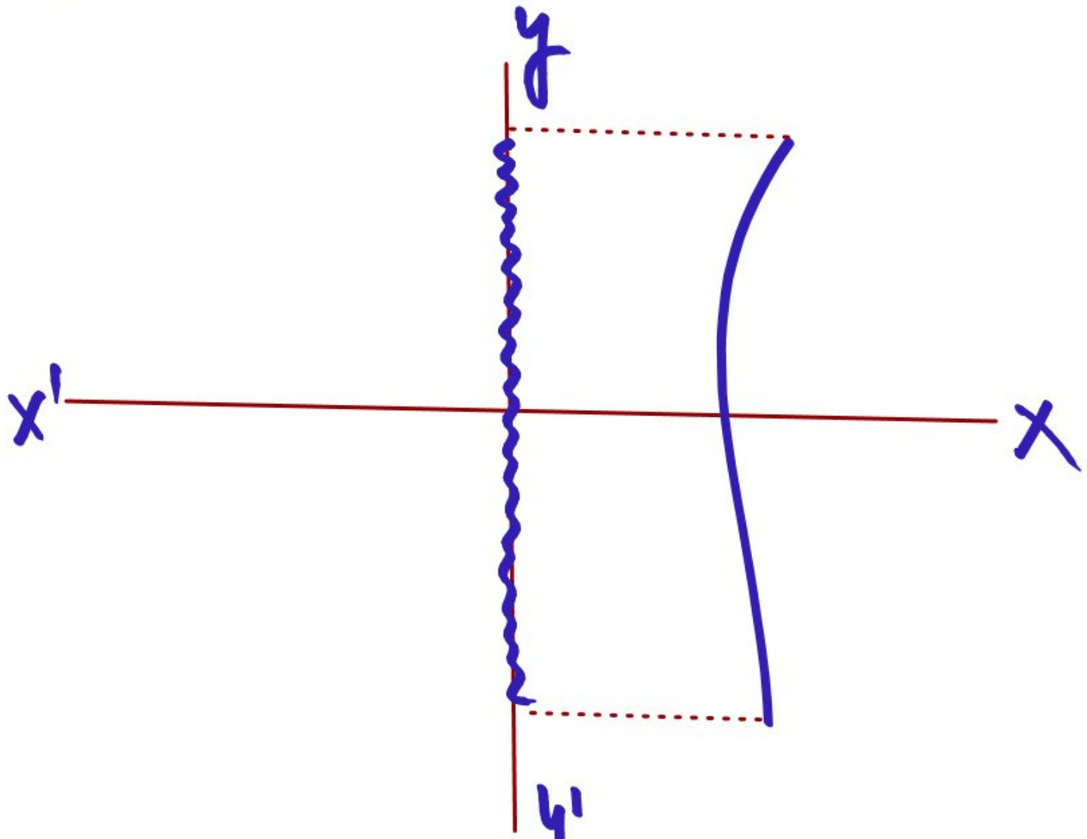
Method-2

graph →



All the possible value on the y-axis Covered by graph of F(x) function.

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Methods to find Domain

1. Expression under even root should be non-negative.
2. Denominater should be non-zero.

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